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Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

JUL 7 2004

04-AMCP-0342

Mr. Nicholas Ceto, Program Manager
Office of Environmental Cleanup
Hanford Project Office
U.S. Environmental Protection Agency
712 Swift Boulevard, Suite 5
Richland, Washington 99352

RECEIVED
JUL 20 2004
EDMC

Dear Mr. Ceto:

K BASINS INTERIM REMEDIAL ACTION DESIGN CHANGE – K EAST BASIN SLUDGE
CONSOLIDATION CONTAINERS

Enclosed is a "non-significant or minor" change to the remedial design report for your review and approval, and inclusion into the 100-KR-2 Administrative Record regarding the removal of sludge from the 105 K East Basin per Section 4.3 of the Remedial Design Report and Remedial Action Work Plan for the K Basins Interim Remedial Action (RDR/RAWP), DOE/RL-99-89, Revision 1. This change consists of adding underwater sludge consolidation containers. The remedial design is being performed in accordance with PHMC Section 2.1.1.1, "K Basin Deactivation." This action is consistent with the path forward agreed to in the proposed Tri-Party Agreement milestones for sludge removal.

A draft copy of the RDR/RAWP was previously provided to Larry Gadbois, of your staff, and comments received have been incorporated. We appreciate the time your staff has taken to provide input early in the process.

If there are any questions, please contact me, or your staff may contact Matt McCormick, Assistant Manager for the Central Plateau, on (509) 373-9971, or Joel Hebdon, Director, Office of Environmental Services, on (509) 376-6657.

Sincerely,

Keith A. Klein
Manager

AMCP:JWT

Enclosure

cc: See Page 2

Mr. Nicholas Ceto
04-AMCP-0342

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JUL 07 2004

cc w/encl:

L. D. Crass, FHI

L. J. Cusack, Ecology

L. E. Gadbois, EPA

T. W. Halverson, FHI

S. Harris, CTUIR

J. S. Hertzfel, FHI

R. Jim, YN

T. M. Martin, HAB

E. J. Murphy-Fitch, FHI

K. Niles, OOE

R. E. Piippo, FHI

S. M. Sax, WSMS

P. Sobotta, NPT

D. J. Watson, FHI

M. A. Wilson, Ecology

Administrative Record, 100-KR-2

Environmental Portal

Fluor Hanford
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Richland, Washington 99352

FLUOR

MAY 6 2004

FH-0400940
CONTRACT NO. DE-AC06-96RL13200

Mr. Keith A. Klein, Manager
U. S. Department of Energy
Richland Operations Office A7-50
Post Office Box 550
Richland, Washington 99352

Dear Mr. Klein:

K BASINS INTERIM REMEDIAL ACTION DESIGN CHANGE – K EAST BASIN SLUDGE CONSOLIDATION CONTAINERS

The purpose of this letter is to identify and obtain RL and U.S. Environmental Protection Agency (EPA) approval of a change in the remedial design associated with the removal of sludge from the 105 K East Basin per Section 4.3 of the *Remedial Design Report and Remedial Action Work Plan for the K Basins Interim Remedial Action (RDR/RAWP)*, DOE/RL-99-89, Revision 1. This change consists of adding underwater sludge consolidation containers. The remedial design is being performed in accordance with PHMC Section 2.1.1.1, "K Basin Deactivation."

Attachment 1 to this letter is a description of the design change and an assessment as to its significance consistent with Section 4.3 of the RDR/RAWP. This design change is considered nonsignificant as it does not impact the requirements of the Record of Decision and is similar with the design approach originally defined in the RDR/RAWP, i.e. use of an underwater interim staging tank for sludge. Revising the RDR for this change is not considered necessary. However, FH recommends that RL place the enclosed design change documentation in the Administrative Record for the K Basins Comprehensive Environmental Response, Compensation, and Liability Act Interim Remedial Action.

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MAY - 6 2004
DOE-RL/RLCC

Mr. Keith A. Klein

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MAY 6 2004

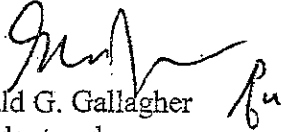
FH-0400940

CONTRACT NO. DE-AC06-96RL13200

The use of biweekly project status meetings with EPA as a participant over the past years has been effective in keeping EPA informed on a more real time basis on the design, construction, and startup testing efforts. Considering the above, these changes in the remedial design would not be considered anything new beyond that which has been previously communicated.

Technical questions should be directed to Mr. S. M. Sax on 373-5377; contractual questions should be referred to Mr. S. W. Bork on 376-5212.

Very truly yours,


Ronald G. Gallagher
President and
Chief Executive Officer

pld

Attachment

RL - J. B. Hebdon
M. S. McCormick
D. S. Shoop
S. A. Sieracki
J. W. Todd
S. J. Veitenheimer (w/o attachments)

FH-0400940

Attachment

K Basins Interim Remedial Design Change Description
K East Sludge Consolidation

Consisting of 6 pages, including cover page

K Basins Interim Remedial Design Change Description K East Sludge Consolidation

OBJECTIVE/PURPOSE

The purpose of the K East Sludge Consolidation System is to consolidate the K East Basin sludge, except for the north loadout pit sludge, into containers located under water in the basin. Consolidating the sludge, material ¼" and smaller, into containers will facilitate inspection of the basin floor for any fuel fragments and their removal. With both fuel and sludge removed off the basin floor, those deactivation and decommissioning (D&D) activities associated with preparing the basin for removal (e.g. grouting) can commence in parallel with removal of the sludge from the basin. The sludge containers will also provide a robust defense in depth improvement in protecting against the release of sludge to the soil and groundwater beneath the basin. The containers will be placed inside the weasel pit, the entrance to the weasel pit, and the two entrances to the tech view pit. (See Figure 1) Sludge from different K East Basin locations, including the main basin floor, tech view pit, weasel pit, dummy elevator pit, will be vacuumed and pumped to the containers located in the pit areas.

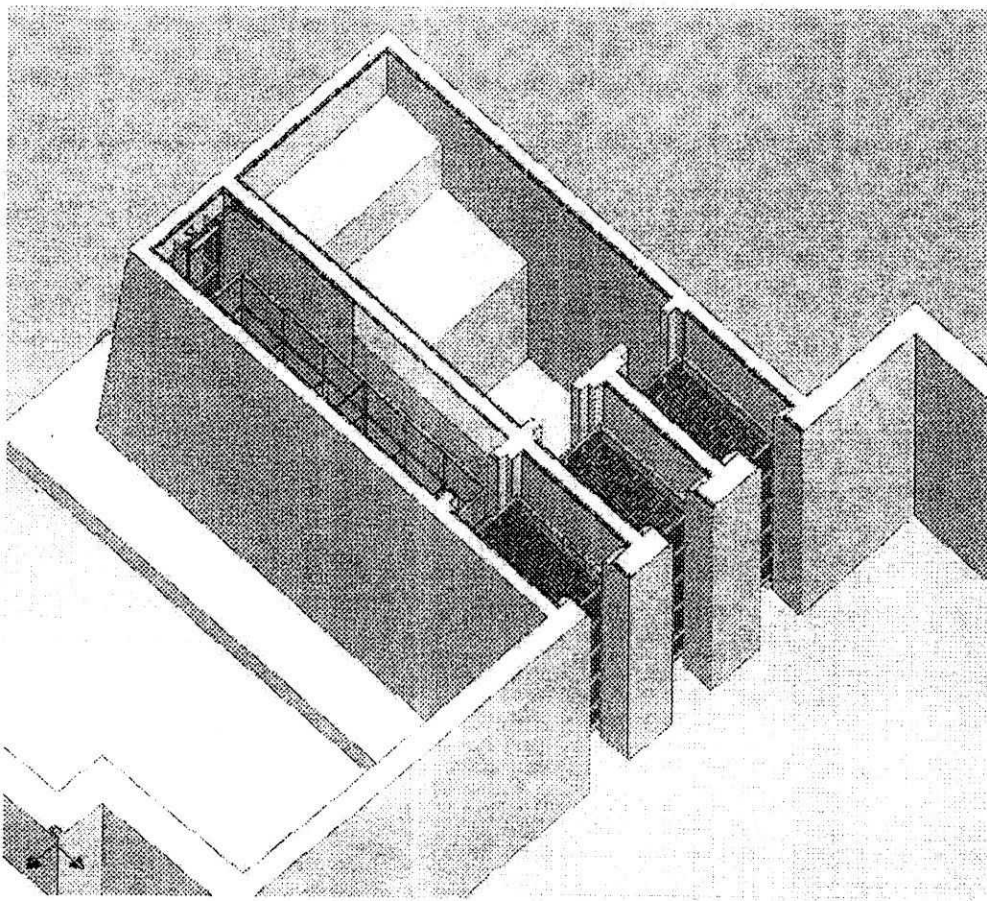


Figure 1 – Location of K East Sludge Containers

The end state of the K East Basin sludge consolidation is containerization of K East Basin sludge in the containers underwater in the K East Basin. It is expected that a nominal volume of approximately 37 cubic meters (m^3) of as-settled sludge will be contained along with basin water. This is equivalent to approximately 51 metric tons of sludge, including approximately 4.2 metric tons of total uranium that will be consolidated in the containers.

PROCESS DESCRIPTION

The K East Basin sludge consolidation system consists of four processes as follows:

Sludge Collection - consists of existing K Basin pumps, manual controls, and connecting hoses with cam lock fittings. There are two pumping systems available, the Tri-Nuclear pump and the sludge water system (SWS) pumps. The Sludge Consolidation System is designed to permit either or both pumping systems to be used.

Flocculant Addition - consists of a turbidimeter, flow meter, flow control valve, static inline mixer with flocculant injection port, and flocculant supply system. This process is used to enhance the settling of sludge that is pumped into the sludge containers.

Sludge Settling - consists of four open topped containers located in the Tech View Pit entrances, Weasel Pit entrance, and Weasel Pit. Containers are provided with inclined tube settlers. The containers will be open top, rigid, self-supporting, and free-standing. The bottoms of the containers are sloped towards a valve connection on the basin end. Together, the containers have a capacity of approximately 51 m^3 for sludge containment. Each container has inclined-tube settlers installed in its top section to improve particle settling. Each container is equipped with a level detector which will indicate when the sludge in the container is at the designed full level. The clear water overflow will be returned to the basin over the top of the open containers. This overflow will have a turbidity meter to gage the clarity of the water returning to the basin.

Short Term Sludge Storage - consists of the four containers used for settling the sludge with the inclined tube settlers removed after sludge has been retrieved from the basin into the containers. The top section of each container may also be removed if necessary to maintain the top of the container below the minimum basin water level, and will not affect the designed storage capacity. Provisions may be included to recirculate basin water over the sludge layer if necessary.

Two basic sludge container designs are necessary; one for the weasel pit and one for the entrances to the weasel pit and tech view pits. The design and functional requirements for the sludge containers are as follows:

- Sludge containers shall be free standing and self supporting in an underwater and dry environment
- Sludge containers shall be constructed from welded and bolted stainless steel
- For loading condition the specific gravity assumed is 1.5
- A minimum water cover of three feet shall be maintained above the sludge
- Sludge containers shall be sized to maximize use of the floor space in the pits

- Sludge containers shall be fabricated in sections capable of being moved into and through the basin
- Sludge container sections shall be assembled above their final location as the container is lowered into the basin
- Sludge container sections shall be assembled with gasketed and bolted flanges
- The total volume of the sludge containers shall be adequate to contain approximately 51 m³ of settled sludge
- Sludge containers shall be sloped at the bottom to aid in future retrieval of sludge
- Sludge containers shall be equipped with an inclined tube settler to improve solids settling and water clarity
- The exterior and interior of the sludge containers shall maintain hydraulic contact with the basin water
- The gaskets for the containers shall be resistant to the radiation field present.
- The operation life of the containers is two years.

Design Life

The requirement for the operational life of the containers is two years. The materials used in the construction of the container have a design life of thirty years. The containers are made from stainless steel sheet, angles, pipe, and bolts. The gaskets are made from ethylene propylene diene monomer (EPDM).

The containers will require assembly in the basin area. Due to space restrictions leak testing of the containers is not feasible after assembly in the basin. To assure the leak tightness of the container the following steps will be followed:

- The containers will be assembled in the fabrication shop following a procedure (i.e. bolts tight to a specified torque in a given order).
- The container is leak tested by filling the container with water to the top. The container will stay full for a minimum of four hours and then be inspected for leaks.
- Once leak tight the container will be disassembled and shipped to the site.
- When received on the site the container sub parts will be inspected for damage, all damage will be repaired.
- Assembly of the container in the basin area will be made with new bolts and gaskets following the same procedure and specifications as the assembly in the fabrication shop.

STRUCTURAL REQUIREMENTS

Earthquake design shall comply with the Uniform Building Code (UBC), Seismic Zone 2B.

Loading combinations shall be in accordance with UBC 1997.

Steel design, fabrication, and installation, with the exception of lifting devices, shall be in accordance with the American Institute of Steel Construction Manual (AISC), 9th Ed.

Welding shall comply with applicable sections of the American Welding Society standards.

General Consideration Of Materials Of Construction

- Materials of construction will resist erosion caused by solid sludge particles.
- Basin sludge contains highly radioactive material; therefore materials of construction for handling or containing sludge/sludge water will be radiation resistant.
- Piping and containers will be constructed of 304L stainless steel, unless abrasion resistance requires harder alloys.

Design Change Significance

The significance of this design change is considered "nonsignificant" per Section 4.3 of DOE/RL-99-89, Rev. 1, *Remedial Design Report and Remedial Action Work Plan for the K Basins Interim Remedial Action*. The basis for this is that the sludge consolidation containers now planned are functionally equivalent to the interim staging tanks that were in the original design then removed due to uncertainty in particle size distribution and loading of large diameter containers for interim storage at T Plant. This uncertainty in particle size distribution will not impact container function and is not of prime importance since the sludge is planned to be either transferred (probably to K West Basin) for consolidation and treatment or treated directly out of the K East Basin.

REMEDIAL DESIGN REPORT
DOE/RL-99-89, Rev. 1

SLUDGE REMOVAL SECTION

Change History Requiring In-Pool Sludge Containerization

As described in the original RDR	As amended in 2003	As currently planned
IST (interim staging tank) is planned to stage sludge underwater in the K East Basin for up to 6 months.	IST has been removed from the plans because of uncertainty in particle distribution and separation of radioactive constituents. That would in turn provide uncertainties in future LDC loadings.	4 interim storage containers are planned to stage all KE Basin sludge, except the north loadout pit sludge, underwater in the weasel pit, the entrance to the weasel pit, and the north and south entrances to the tech view pit. The sludge will be consolidated here, and will be isolated from the rest of the K E Basin.
Documents such as the Functional Design Criteria (FDC) include sludge removed from both the K East and K West Basins. The K West Basin Retrieval System (RS) was to be the same design as the K East RS.	The K West sludge removal system was removed from the scope of the Functional Design Criteria because as the safety bases matured it became apparent the same load out methodology for both basins could not be used. This is because of differences in the material properties such as KW sludge is more reactive. As the planning and safety basis for K West matures either the FDC will be updated to include it or it will be in a separate FDC.	The FDC (SNF-8166, Rev. 3 with HNF-EDC-04-20012) has been revised to limit its scope to the removal of the KE north loadout pit sludge. The functions and requirements associated with the in-pool sludge containers are described in "Functional Requirements Document for the K Basins Sludge Project, HNF-20135, Rev. A".